

# **METHOD AND APPARATUS USING MICROSCOPIC AND INTERFEROMETRIC BASED DETECTION**

## **ABSTRACT**

5           An integrated interferometric and intensity based microscopic inspection  
system inspects semiconductor samples. A switchable illumination module provides  
illumination switchable between interferometric inspection and intensity based  
microscopic inspection modes. Complex field information is generated from  
interference image signals received at a sensor. Intensity based signals are used to  
10   perform the microscopic inspection. The system includes at least one illumination  
source for generating an illumination beam and an integrated interferometric  
microscope module for splitting the illumination beam into a test beam directed to the  
semiconductor sample and a reference beam directed to a tilted reference mirror. The  
beams are combined to generate an interference image at an image sensor. The tilted  
15   reference mirror is tilted with respect to the reference beam that is incident on the  
mirror to thereby generate fringes in the interference image. The system also includes  
an image sensor for acquiring the interference image from the inteferometric  
microscope module and intensity signals from the microscopic inspection image.

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